

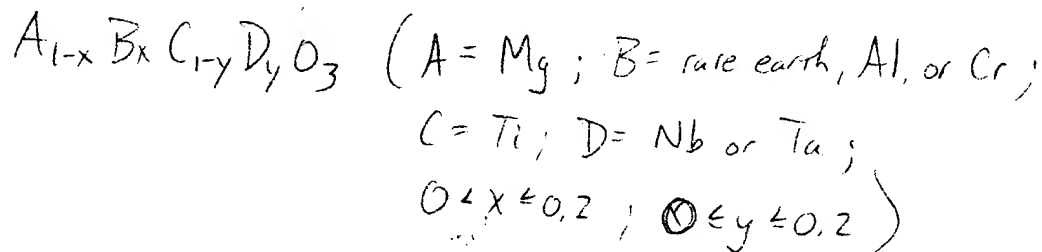
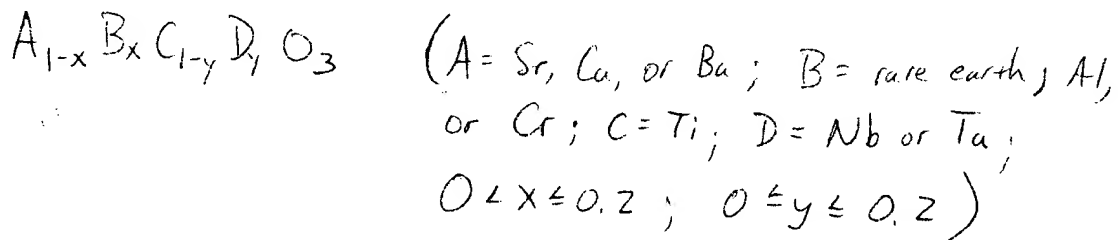
1519
SEARCH REQUEST FORM

Requestor's Name: Jonathan Crepeau (75637) Serial Number: 09/118,833
 Date: 4/3/00 Phone: 305-0051 Art Unit: 1745

Mailbox: CP3 4A01
Results: Paper
Search Topic:

Please write a detailed statement of search topic. Describe specifically as possible the subject matter to be searched. Define any terms that may have a special meaning. Give examples or relevant citations, authors keywords, etc., if known. For sequences, please attach a copy of the sequence. You may include a copy of the broadest and/or most relevant claim(s).

Fuel cell containing either of the following compositions:
 (NOT in an ~~electrolyte~~ electrolyte, however).



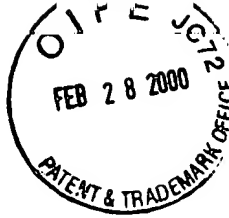
Searches are of equal priority.

(see attached claims 6 + 8)

Title: Solid Electrolyte Type Fuel Battery
 Inventors: Toshiro Nishi; Nobuki Murakami; Hirokazu Yamamoto
 Earliest Priority: 8/8/97 (JP)

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Date completed: <u>4-3-00</u>	Search Site	Vendors
Searcher: <u>BT</u>	<u>✓</u> STIC	<u>✓</u> IG Suite
Terminal time: <u>60</u>	_____ CM-1	<u>✓</u> STN #119.70
Elapsed time: _____	_____ Pre-S	_____ Dialog
CPU time: _____	Type of Search	_____ APS
Total time: <u>70</u>	_____ N.A. Sequence	_____ Geninfo
Number of Searches: _____	_____ A.A. Sequence	_____ SDC
Number of Databases: <u>2</u>	<u>✓</u> Structure ⁽¹⁾	_____ DARC/Questel
	<u>✓</u> Bibliographic ⁽²⁾	_____ Other



Application No. 09/118,833
Attorney Docket No. 965-232P

type fuel battery is of a co-sinter type, and comprises a material having a matrix of the general formula $MTiO_3$ where M is Mg, Ca, Sr, or Ba.

5. The solid electrolyte type fuel battery as claimed in claim 4, wherein the current passage of the interconnector is current collection in the vertical direction.

6. A solid electrolyte type fuel battery in which an interconnector for connecting cells of the solid electrolyte type fuel battery comprises a material having a matrix of the general formula $A_{1-x}B_xC_{1-y}D_yO_3$ where A is Ca, Sr or Ba, B is a rare earth element, aluminum or chromium, C is titanium, D is niobium or tantalum, $0 < x \leq 0.2$ and $0 \leq y \leq 0.2$.
 $y \neq 0$ (L1) L11
 $y = 0$ (L2) L12

7. The solid electrolyte type fuel battery as claimed in claim 6, wherein the current passage of the interconnector is current collection in the vertical direction.

8. A solid electrolyte type fuel battery in which an interconnector for connecting cells of the solid electrolyte type fuel battery comprises a material having a matrix of the general formula $A_{1-x}B_xC_{1-y}D_yO_3$ where A is Mg, B is a rare earth

element, aluminum or chromium, C is titanium, D is niobium or tantalum, $0 < x \leq 0.2$ and $0 \leq y \leq 0.2$. $y \neq 0$ (LB) 413
 $y = 0$ (LB) 444

9. The solid electrolyte type fuel battery as claimed in claim 8, wherein the current passage of the interconnector is current collection in the vertical direction.

10. A solid electrolyte type fuel battery in which an interconnector for connecting cells of the solid electrolyte type fuel battery comprises a material having a matrix of the general formula $MTiO_3$ where M is Mg, Ca, Sr, or Ba, wherein the interconnector is integrally burned within said battery.

11. The solid electrolyte type fuel battery as claimed in claim 10, wherein said battery comprises fuel electrode, electrolyte, interconnector and air electrode laminated onto a substrate, which are integrally burned within said battery.

12. A method of making the solid electrolyte type fuel battery of claim 4, which comprises integrally burning within said battery the interconnector for connecting cells of the solid electrolyte type fuel battery.

=> file reg

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(FILE 'HOME' ENTERED AT 10:11:39 ON 05 APR 2000)

FILE 'REGISTRY' ENTERED AT 10:11:45 ON 05 APR 2000

L1	11400	SEA ((CA OR SR OR BA)(L)TI(L)O)/ELS (L) (LNTH/PG OR AL/ELS OR CR/ELS)
L2	1239	SEA L1 (L) 4/ELC.SUB
L3	1986	SEA L1 (L) (NB OR TA)/ELS
L4	131	SEA L3 (L) 5/ELC.SUB
L5	3096	SEA (MG(L)TI(L)O)/ELS (L) (LNTH/PG OR AL/ELS OR CR/ELS)
L6	102	SEA L5 (L) 4/ELC.SUB
L7	902	SEA L5 (L) (NB OR TA)/ELS
L8	10	SEA L7 (L) 5/ELC.SUB

FILE 'HCA' ENTERED AT 10:22:46 ON 05 APR 2000

L9	146122	SEA BATTERY OR BATTERIES OR (ELECTROCHEM? OR ELECTROLY? OR GALVANI? OR FUEL? OR DRY OR WET OR PRIMARY OR SECONDARY)(2A)(CELL OR CELLS) OR DRYCELL? OR WETCELL? OR FUELCELL?
L10	25361	SEA INTERCONNECT?
L11	70	SEA L4
L12	777	SEA L2
L13	7	SEA L8
L14	161	SEA L6
L15	22802	SEA SOLID?(2A)ELECTROLY?
L16	2	SEA L11 AND (L9 OR L10 OR L15)
L17	15	SEA L12 AND (L9 OR L10 OR L15)
L*** DEL	0	S L8 AND (L9 OR L10 OR L15)
L18	0	SEA L13 AND (L9 OR L10 OR L15)
L19	2	SEA L16 AND (L9 OR L10 OR L15)

FILE 'LCA' ENTERED AT 10:27:03 ON 05 APR 2000

L20 1513 SEA (52 OR 72)/SC,SX

FILE 'HCA' ENTERED AT 10:27:16 ON 05 APR 2000

L21 17 SEA L20 AND (L11 OR L12 OR L13 OR L16)

FILE 'REGISTRY' ENTERED AT 10:28:15 ON 05 APR 2000

L22 365 SEA (L4 OR L2) AND 3/O

L23 2 SEA (L8 OR L6) AND 3/O

FILE 'HCA' ENTERED AT 10:29:10 ON 05 APR 2000

L24 201 SEA L22

L25 2 SEA L23

L26 9 SEA L24 AND (L9 OR L10 OR L15 OR L20)

L27 22 SEA L16 OR L17 OR L19 OR L21 OR L25 OR L26
D COST

FILE 'REGISTRY' ENTERED AT 10:34:04 ON 05 APR 2000

FILE 'REGISTRY' ENTERED AT 10:34:45 ON 05 APR 2000

FILE HOME

FILE REGISTRY

STRUCTURE FILE UPDATES: 4 APR 2000 HIGHEST RN 260810-31-9

DICTIONARY FILE UPDATES: 4 APR 2000 HIGHEST RN 260810-31-9

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 13, 1999

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=> d 127 1-22 bib abs hitstr hitind

L27 ANSWER 1 OF 22 HCA COPYRIGHT 2000 ACS

AN 132:110086 HCA

TI High-pressure and -temperature synthesis and characterization of mixed valence perovskite oxides LaTi_{1-x}MgxO₃

AU Miao, J. -P.; Li, L. -P.; Song, Y. -B.; Xu, D. -P.; Lu, Z.; Su, W. -H.

CS Northeast Normal University and Department of Physics, Institute of Theoretical Physics, Jilin University, Changchun, Peop. Rep. China

SO Mater. Chem. Phys. (2000), 62(3), 226-229

NO FL

Bad date

Mg(1)

CODEN: MCHPDR; ISSN: 0254-0584

PB Elsevier Science S.A.

DT Journal

LA English

AB Perovskite oxides $\text{LaTi}_{1-x}\text{Mg}_x\text{O}_3$ ($x = 0.25, 0.5$) were synthesized using high-pressure and-temp. method. $\text{LaTi}_{0.75}\text{Mg}_{0.25}\text{O}_3$ is a new compd. This new synthesis route has some advantages. XRD anal. showed that the $x = 0.25$ sample belongs to cubic perovskite-type structure and the $x = 0.5$ sample belongs to orthorhombic perovskite-type structure. EPR measurement indicated that Ti ions were in mixed valence state of +3 and +4. IR measurement indicated that the vibration frequency and width of BO₆ octahedron stretching vibration absorption band decreases with the increasing of x . The valence state of Ti ions can be altered by high-pressure and -temp.

IT **255916-99-5P**, Lanthanum magnesium titanium oxide

(LaMg_{0.25}Ti_{0.75}O₃)

(high-pressure and -temp. synthesis and characterization of mixed valence perovskite oxides)

RN 255916-99-5 HCA

CN Lanthanum magnesium titanium oxide (LaMg_{0.25}Ti_{0.75}O₃) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ti	0.75	7440-32-6
Mg	0.25	7439-95-4
La	1	7439-91-0

CC 49-4 (Industrial Inorganic Chemicals)

IT 12056-93-8P, Lanthanum magnesium titanium oxide (La₂MgTiO₆)

255916-99-5P, Lanthanum magnesium titanium oxide
(LaMg_{0.25}Ti_{0.75}O₃)

(high-pressure and -temp. synthesis and characterization of mixed valence perovskite oxides)

L27 ANSWER 2 OF 22 HCA COPYRIGHT 2000 ACS

AN 132:80840 HCA

TI New mixed conductors based on doped layered perovskites

AU Navas, Carlos; Tuller, Harry L.; Loye, Hans-Conrad zur

CS Dept. of Materials Science and Engineering, Massachusetts Institute
of Technology, Cambridge, MA, 02139, USA

SO Mater. Res. Soc. Symp. Proc. (1999), 548(Solid State Ionics V),
533-538

CODEN: MRSPDH; ISSN: 0272-9172

PB Materials Research Society

DT Journal

LA English

AB A series of doped Ruddlesden-Popper phases, of general formula
 $\text{Sr}_3\text{Ti}_2\text{-xM}_x\text{O}_7\text{-}\delta$. ($M = \text{Al, Ga, Co}$), were synthesized and their
elec. cond. characterized as a function of temp. and oxygen partial

pressure. For fixed-valent dopants, p-type cond. predominates at $p(O_2) > 10^{-5}$ atm, followed by a $p(O_2)$ -independent electrolytic regime, and n-type electronic cond. at very low $p(O_2)$. The electrolytic regime exhibits activation energies in the range 1.7-1.8 eV. Doping with transition metals such as Co results in a very significant increase in total cond. with a p-type cond. at high $p(O_2)$. Furthermore, an apparent ionic regime at intermediate $p(O_2)$ is obsd., characterized by high cond. ($> 10^{-2}$ S/cm at 700.degree.) and low activation energy (0.7 eV). This interpretation is consistent with iodometric measurements as interpreted by a defect chem. model. Other measurements are in progress to confirm this conclusion.

IT **137972-11-3**, Aluminum strontium titanium oxide
(mixed conductors based on doped layered perovskites)
RN 137972-11-3 HCA
CN Aluminum strontium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Ti	x	7440-32-6
Sr	x	7440-24-6
Al	x	7429-90-5

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 76

ST **fuel cell** mixed conductor layered perovskite;
sensor mixed conductor layered perovskite; strontium titanate doped mixed conductor

IT Electric conductivity
Nonstoichiometry
Sensors
Solid state **fuel cells**

(mixed conductors based on doped layered perovskites)

IT **137972-11-3**, Aluminum strontium titanium oxide
188849-71-0, Gallium strontium titanium oxide $Ga_{0.2}Sr_3Ti_{1.8}O_{6.9}$
226917-78-8D, Cobalt strontium titanium oxide $Co_{0.8}Sr_3Ti_{1.2}O_7$,
oxygen-deficient 253598-55-9D, Cobalt strontium titanium oxide
($Co_{0.6}Sr_3Ti_{1.4}O_7$), oxygen-deficient 253598-56-0D, Cobalt strontium
titanium oxide ($Co_{0.4}Sr_3Ti_{1.6}O_7$), oxygen-deficient 253598-57-1D,
Cobalt strontium titanium oxide ($Co_{0.2}Sr_3Ti_{1.8}O_7$), oxygen-deficient
(mixed conductors based on doped layered perovskites)

L27 ANSWER 3 OF 22 HCA COPYRIGHT 2000 ACS

AN 131:325051 HCA

TI Solid electrolyte fuel cell involving thermally stable electric conductor

IN Hashimoto, Tsutomu; Yamashita, Akihiro; Nishi, Toshiro

PA Mitsubishi Heavy Industries, Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

Bad date

Mg (2)

DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11307114	A2	19991105	JP 1998-192634	19980708
PRAI	JP 1998-36904	19980219			

AB The fuel cell having an interconnector and an air electrode involves a thermally stable highly elec. conductive fine film showing low reactivity both with the connector and the electrode and the film is placed between the connector and the electrode. The fine film, for inhibiting diffusion of elements from the air electrode to the interconnector, may consist of perovskite oxides $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$ and $\text{La}_{1-x}\text{Ca}_x\text{FeO}_3$ ($x = 0.1-0.5$). The fuel cell shows stable power performance, i.e., without lowering of voltage.

IT **248592-13-4**, Magnesium lanthanum titanium oxide ($\text{Mg}_{0.9}\text{La}_{0.1}\text{TiO}_3$)

(film; solid electrolyte fuel cell involving film for inhibiting diffusion of elements placed between interconnector and air electrode)

RN 248592-13-4 HCA

CN Lanthanum magnesium titanium oxide ($\text{La}_{0.1}\text{Mg}_{0.9}\text{TiO}_3$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	1	7440-32-6
Mg	0.9	7439-95-4
La	0.1	7439-91-0

IC ICM H01M008-12

ICS H01M008-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57

IT 139763-82-9, Calcium iron lanthanum oxide ($\text{Ca}_{0.4}\text{FeLa}_{0.6}\text{O}_3$)

248592-13-4, Magnesium lanthanum titanium oxide ($\text{Mg}_{0.9}\text{La}_{0.1}\text{TiO}_3$)

(film; solid electrolyte fuel cell involving film for inhibiting diffusion of elements placed between interconnector and air electrode)

L27 ANSWER 4 OF 22 HCA COPYRIGHT 2000 ACS

AN 131:294873 HCA

TI Current threshold oxygen sensor and oxygen detection method.

IN Onishi, Hisao; Yajima, Tamotsu; Kajimura, Atsuko

PA Osaka Gas Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11281611	A2	19991015	JP 1998-85802	19980331
AB	The title sensor is characterized by having long time stability, good precision, and less electrode deterioration due the contact with anal. gases contg. corrosion components. The sensor comprises an O diffusion layer made of a dense electroconductive oxide mixt. capable of conducting both oxide ions and electrons and a solid electrolyte O sensing element, which is covered by the diffusion layer. A pair of electrodes are on both side of the solid electrolyte sensing element. The sensor can be used for monitoring O concn. in exhaust gases.				
IT	246221-09-0D , Aluminum calcium titanium oxide (Al _{0.25} CaTi _{0.75} O ₃), oxygen deficient (current threshold oxygen sensor and oxygen detection method)				
RN	246221-09-0 HCA				
CN	Aluminum calcium titanium oxide (Al _{0.25} CaTi _{0.75} O ₃) (9CI) (CA INDEX NAME)				

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ca	1	7440-70-2
Ti	0.75	7440-32-6
Al	0.25	7429-90-5

IC ICM G01N027-41

CC 79-2 (Inorganic Analytical Chemistry)
Section cross-reference(s): 72

ST **solid electrolyte** current threshold oxygen sensor

IT Gas analysis
Solid electrolyte gas sensors
Waste gases
(current threshold oxygen sensor and oxygen detection method)

IT 1314-23-4, Zirconia, uses 7440-06-4, Platinum, uses 12037-01-3, Terbium oxide (Tb₂O_{3.5}) 12310-74-6D, Cobalt lanthanum strontium oxide (Co₂LaSrO₆), oxygen deficient 106390-66-3D, Lanthanum manganese strontium oxide (La_{0.7}MnSr_{0.3}O₃), oxygen deficient 107121-72-2D, Iron lanthanum strontium oxide (FeLa_{0.7}Sr_{0.3}O₃), oxygen deficient 114902-12-4, Cobalt iron lanthanum strontium oxide (Co_{0.8}Fe_{0.2}La_{0.8}Sr_{0.2}O₃) 114902-12-4D, Cobalt iron lanthanum strontium oxide (Co_{0.8}Fe_{0.2}La_{0.8}Sr_{0.2}O₃), oxygen deficient 116327-13-0D, Calcium iron titanium oxide (CaFe_{0.3}Ti_{0.7}O₃), oxygen deficient 119685-73-3, Terbium zirconium oxide (Tb_{0.6}Zr_{0.7}O_{2.45}) 124026-93-3D, Iron strontium titanium oxide (Fe_{0.3}SrTi_{0.7}O₃), oxygen deficient 128607-86-3D, Cobalt manganese strontium oxide (Co_{0.2}Mn_{0.8}SrO₃), oxygen deficient 131163-39-8, Cerium terbium oxide (Ce_{0.5}Tb_{0.2}O_{2.75}) 144021-21-6D, Aluminum calcium lanthanum oxide (AlCa_{0.1}La_{0.9}O₃), oxygen deficient 151750-11-7, Cobalt

copper strontium oxide ($\text{Co}_{0.8}\text{Cu}_{0.2}\text{SrO}_3$) 159686-45-0, Aluminum lanthanum magnesium oxide ($\text{Al}_{0.95}\text{LaMg}_{0.05}\text{O}_3$) 161563-15-1D, Lanthanum manganese strontium oxide ($\text{La}_{0.63}\text{MnSr}_{0.27}\text{O}_3$), oxygen deficient 165902-06-7, Aluminum magnesium samarium oxide ($\text{Al}_{0.95}\text{Mg}_{0.05}\text{SmO}_3$) 165902-07-8, Aluminum gadolinium magnesium oxide ($\text{Al}_{0.95}\text{GdMg}_{0.05}\text{O}_3$) 165902-08-9, Aluminum magnesium yttrium oxide ($\text{Al}_{0.95}\text{Mg}_{0.05}\text{YO}_3$) **246221-09-0D**, Aluminum calcium titanium oxide ($\text{Al}_{0.25}\text{CaTi}_{0.75}\text{O}_3$), oxygen deficient
(current threshold oxygen sensor and oxygen detection method)

L27 ANSWER 5 OF 22 HCA COPYRIGHT 2000 ACS *Anode material*
 AN 131:202155 HCA
 TI Characterization of new ceramic anode materials for direct methane oxidation in SOFC
 AU Pudmich, G.; Jungen, W.; Tietz, F.
 CS Research Centre Julich, Institute for Materials and Processes in Energy Systems (IWV-1), Julich, D-52425, Germany
 SO Proc. - Electrochem. Soc. (1999), 99-19(Solid Oxide Fuel Cells (SOFC VI)), 577-582
 CODEN: PESODO; ISSN: 0161-6374
 PB Electrochemical Society
 DT Journal
 LA English
 AB Various perovskite materials, based on lanthanum chromite or strontium titanate, were synthesized and studied considering their use as ceramic anodes in SOFC. The powders were characterized by TG/DTA and XRD. Cond. data between room temp. and 900.degree. both in oxidizing and reducing atm. were collected. The expansion behavior in both atmospheres was investigated and the thermal expansion coeff. up to 1200.degree. detd. Some materials showed elec. conductivities up to 100 S/cm, other had promising thermomech. properties. So far a combination of the advantageous properties has not been found for the materials under consideration.
 IT **120501-49-7**, Lanthanum strontium titanium oxide $\text{La}_{0.4}\text{Sr}_{0.6}\text{TiO}_3$ **241138-32-9**, Calcium lanthanum titanium oxide ($\text{Ca}_{0.3}\text{La}_{0.7}\text{TiO}_3$)
 (characterization of new ceramic anode materials for direct methane oxidn. in solid oxide **fuel cells**)
 RN 120501-49-7 HCA
 CN Lanthanum strontium titanium oxide ($\text{La}_{0.4}\text{Sr}_{0.6}\text{TiO}_3$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ti	1	7440-32-6
Sr	0.6	7440-24-6
La	0.4	7439-91-0

RN 241138-32-9 HCA
 CN Calcium lanthanum titanium oxide ($\text{Ca}_{0.3}\text{La}_{0.7}\text{TiO}_3$) (9CI) (CA INDEX NAME)

(NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ca	0.3	7440-70-2
Ti	1	7440-32-6
La	0.7	7439-91-0

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 57

ST **fuel cell** ceramic anode methane oxidn; lanthanum chromite **fuel cell** anode; strontium titanate **fuel cell** anode

IT Ceramics

Electric conductivity

Fuel cell anodes

Oxidation, electrochemical

Particle size distribution

Solid state **fuel cells**

Thermal expansion

(characterization of new ceramic anode materials for direct methane oxidn. in solid oxide **fuel cells**)

IT **120501-49-7**, Lanthanum strontium titanium oxide

La_{0.4}Sr_{0.6}TiO₃ 241138-30-7, Niobium strontium titanium oxide

(Nb_{0.8}Sr_{0.8}Ti_{0.2}O₃) 241138-31-8, Calcium chromium iron lanthanum

oxide (Ca_{0.3}Cr_{0.8}Fe_{0.2}La_{0.7}O₃) **241138-32-9**, Calcium

lanthanum titanium oxide (Ca_{0.3}La_{0.7}TiO₃) 241138-34-1

241138-35-2 241138-38-5, Calcium chromium lanthanum niobium oxide

(Ca_{0.3}Cr_{0.8}La_{0.7}Nb_{0.2}O₃)

(characterization of new ceramic anode materials for direct methane oxidn. in solid oxide **fuel cells**)

IT 74-82-8, Methane, reactions

(characterization of new ceramic anode materials for direct methane oxidn. in solid oxide **fuel cells**)

L27 ANSWER 6 OF 22 HCA COPYRIGHT 2000 ACS

AN 131:201844 HCA

TI **Solid-electrolyte-type electrochemical cell** and manufacture of hydrogen using it

IN Yamashita, Akihiro; Hashimoto, Tsutomu

PA Mitsubishi Heavy Industries, Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
PI JP 11241195	A2	19990907	JP 1998-46850	19980227

Bad data

AB The title **electrochem. cell** is equipped with electrodes on both sides of a **solid electrolyte**, means for introducing a mixed gas contg. CH₄ and H₂O to neighborhood of the outer electrode, and means for collecting a H gas or a gas contg. H generated at a side of the inner electrode. Also claimed is an app. for manuf. of H, which is equipped with the **electrochem. cell**, means for supplying O to neighborhood of the inner electrode, and means for heating the cell. H is manufd. by heating the **electrochem. cell** at 800-1000.degree., introducing the mixed gas, and then optionally supplying O at the inner electrode side for electrolysis. The method provides good energy efficiency.

IT **194348-99-7**, Cerium strontium titanium oxide (Ce_{0.1}Sr_{0.9}TiO₃)
(**solid electrolytes**; hydrogen manuf. from methane and water by **solid electrolyte-type electrochem. cell**)

RN 194348-99-7 HCA

CN Cerium strontium titanium oxide (Ce_{0.1}Sr_{0.9}TiO₃) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ce ?	0.1	7440-45-1
Ti	1	7440-32-6
Sr	0.9	7440-24-6

IC ICM C25B001-04
ICS C25B009-00

CC 49-1 (Industrial Inorganic Chemicals)
Section cross-reference(s): 72

ST hydrogen manuf **solid electrolyte electrochem cell**; electrolysis methane water
hydrogen manuf

IT **Electrochemical cells**
Electrolysis
Solid electrolytes
Steam
(hydrogen manuf. from methane and water by **solid electrolyte-type electrochem. cell**)

IT 1333-74-0P, Hydrogen, preparation
(hydrogen manuf. from methane and water by **solid electrolyte-type electrochem. cell**)

IT 74-82-8, Methane, reactions 7732-18-5, Water, reactions
(hydrogen manuf. from methane and water by **solid electrolyte-type electrochem. cell**)

IT 7782-44-7, Oxygen, reactions
(reaction of; hydrogen manuf. from methane and water by **solid electrolyte-type electrochem. cell**)

IT 12013-47-7, Calcium zirconium oxide (CaZrO₃) 114168-16-0, Yttrium Zirconium oxide (Y_{0.16}Zr_{0.92}O_{2.08}) 163623-53-8, Titanium yttrium zirconium oxide (Ti_{0.1}Y_{0.16}Zr_{0.82}O_{2.08}) **194348-99-7**, Cerium strontium titanium oxide (Ce_{0.1}Sr_{0.9}TiO₃)

(**solid electrolytes**; hydrogen manuf. from methane and water by **solid electrolyte-type electrochem. cell**)

L27 ANSWER 7 OF 22 HCA COPYRIGHT 2000 ACS μ 0

AN 131:132220 HCA

TI Hollandite anodes for lithium ion **batteries**

AU Barbato, Salvador; Restovic, Ambrosio; Ortiz, Juan; Gautier, Juan Luis

CS Departamento de Quimica, Facultad de Ciencias Basicas, Universidad de Antofagasta, Antofagasta, Chile

SO Bol. Soc. Chil. Quim. (1999), 44(2), 209-216

CODEN: BOCQAX; ISSN: 0366-1644

PB Sociedad Chilena de Quimica

DT Journal

LA English

AB Hollandite structure oxides, BaTi₈O₁₆, BaAl₂Ti₆O₁₆ and BaMn₈O₁₆, were prepd. with the purpose of studying their behavior as insertion anodes to improve the performance of lithium ion **batteries**. The compds. based on Ti became tetragonal hollandites, space group 14/m while BaMn₈O₁₆ presents monoclinic symmetry, space group 12/m. The insertion capacity of Li-ion depends on cation nature in the hollandite and decreases according to the following order: Ti > Mn > Ti-Al. In Ti-based oxides, the specific capacity decreases 22% when Ti is replaced for two Al. The inverse derivs. of the potential (E) vs. intercalate concn. (x) relation showed two max. related with order-disorder lithium insertion process. The diffusion coeffs. of Li⁺ ion insertion decreased with x and they followed the tendency Ti .apprxeq. Mn > Ti-Al. Exptl. cells built using LiMn₂O₄ spinel as a cathode and Ti-hollandites as anode in LiClO₄-PC electrolyte exhibited high capacity of discharge being 105 mAh/g for BaTi₈O₁₆/LiMn₂O₄ and 81 mAh/g for BaAl₂Ti₆O₁₆/LiMn₂O₄. These cells constitute a good alternative in order to improve the security of manipulation of the Li⁺ ion **battery**.

IT **71251-56-4**, Aluminum barium titanium oxide Al₂BaTi₆O₁₆ (hollandite anodes for lithium ion **batteries**)

RN 71251-56-4 HCA

CN Aluminum barium titanium oxide (Al₂BaTi₆O₁₆) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	16	17778-80-2
Ba	1	7440-39-3
Ti	6	7440-32-6
Al	2	7429-90-5

CC **52-2** (Electrochemical, Radiational, and Thermal Energy

Technology)

Section cross-reference(s): 72

ST hollandite anode lithium ion **battery**; lithium insertion
anode hollandite oxide; barium titanium aluminum manganese oxide
hollandite

IT **Battery** anodes

Crystal structure

(hollandite anodes for lithium ion **batteries**)

IT Secondary **batteries**

(lithium; hollandite anodes for lithium ion **batteries**)

IT Diffusion

Intercalation

(of lithium; hollandite anodes for lithium ion **batteries**

)

IT 7439-93-2, Lithium, uses

(diffusion and intercalation of; hollandite anodes for lithium
ion **batteries**)

IT 12057-17-9, Lithium manganese oxide (LiMn_2O_4)

(electrolyte contg.; hollandite anodes for lithium ion
batteries)

IT 7791-03-9, Perchloric acid, lithium salt **71251-56-4**,

Aluminum barium titanium oxide $\text{Al}_2\text{BaTi}_6\text{O}_{16}$ 74245-07-1, Barium
titanium oxide $\text{BaTi}_8\text{O}_{16}$ 121091-92-7, Barium manganese oxide
 $\text{BaMn}_8\text{O}_{16}$

(hollandite anodes for lithium ion **batteries**)

L27 ANSWER 8 OF 22 HCA COPYRIGHT 2000 ACS

AN 131:7461 HCA

TI Niobium based tetragonal tungsten bronzes as potential anodes for
solid oxide **fuel cells**: synthesis and electrical
characterization

AU Slater, P. R.; Irvine, J. T. S.

CS School of Chemistry, University of St. Andrews, St. Andrews, Fife,
KY16 9AJ, UK

SO Solid State Ionics (1999), 120(1-4), 125-134

CODEN: SSIOD3; ISSN: 0167-2738

PB Elsevier Science B.V.

DT Journal

LA English

AB We report studies on a range of niobate based tungsten bronzes, with
a view to analyzing their potential as anode materials in SOFCs.
Six systems were studied, $(\text{Sr}_{1-x}\text{Ba}_x)\text{O}_{0.6}\text{Ti}_{0.2}\text{Nb}_{0.8}\text{O}_3$,
 $\text{Sr}_{0.6-x}\text{La}_x\text{Ti}_{0.2+x}\text{Nb}_{0.8-x}\text{O}_3$, $(\text{Sr}_{0.4-x}\text{Ba}_x)\text{Na}_{0.2}\text{NbO}_3$,
 $(\text{Ba}_{1-x}\text{Ca}_x)\text{O}_{0.6}\text{Ti}_{0.2}\text{Nb}_{0.8}\text{O}_3$, $\text{Ba}_{0.5-x}\text{A}_x\text{NbO}_3$ ($\text{A}=\text{Ca}, \text{Sr}$), and
 $\text{Ba}_{0.3}\text{Nb}_{0.2}\text{O}_{2.8}$, and the elec. conductivities were examd. over a range
of oxygen partial pressures (10-20-1 bar). All the systems showed
good cond. in low oxygen partial pressures, with values as high as 8
 S cm^{-1} at 930.degree. ($\text{P}(\text{O}_2)=10\text{-}20$ bar). As the oxygen partial
pressure was raised the cond. dropped showing in most cases an
approx. $[\text{P}(\text{O}_2)]^{-1/4}$ dependence and good re-oxidn. kinetics. Of all
the samples studied the $(\text{Sr}_{1-x}\text{Ba}_x)\text{O}_{0.6}\text{Ti}_{0.2}\text{Nb}_{0.8}\text{O}_3$ and
 $(\text{Ba}_{1-x}\text{Ca}_x)\text{O}_{0.6}\text{Ti}_{0.2}\text{Nb}_{0.8}\text{O}_3$ systems appear most promising for

Anode material

potential use as anode materials in SOFCs.

IT **11085-27-1P 11085-28-2P**
 (synthesis and elec. characterization of niobium based tetragonal tungsten bronzes as potential anodes for solid oxide **fuel cells**)
 RN 11085-27-1 HCA
 CN Lanthanum niobium strontium titanium oxide (LaNb3Sr2Ti2O15) (9CI)
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	15	17778-80-2
Ti	2	7440-32-6
Sr	2	7440-24-6
Nb	3	7440-03-1
La	1	7439-91-0

RN 11085-28-2 HCA
 CN Lanthanum niobium strontium titanium oxide (LaNb7Sr5Ti3O30) (9CI)
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	30	17778-80-2
Ti	3	7440-32-6
Sr	5	7440-24-6
Nb	7	7440-03-1
La	1	7439-91-0

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
 ST niobium based tetragonal tungsten bronze synthesis; **fuel cell** niobium tetragonal tungsten bronze; anode **fuel cell** tetragonal tungsten bronze
 IT Group VB element compounds
 (niobium bronzes; synthesis and elec. characterization of niobium based tetragonal tungsten bronzes as potential anodes for solid oxide **fuel cells**)
 IT Electric conductivity
Fuel cell anodes
 Solid state **fuel cells**
 (synthesis and elec. characterization of niobium based tetragonal tungsten bronzes as potential anodes for solid oxide **fuel cells**)
 IT Group VIB element compounds
 (tungsten bronzes; synthesis and elec. characterization of niobium based tetragonal tungsten bronzes as potential anodes for solid oxide **fuel cells**)
 IT **11085-27-1P 11085-28-2P** 12009-74-4P, Barium niobium titanium oxide (Ba3Nb4TiO15) 12537-34-7P, Barium calcium

niobium titanium oxide ($\text{Ba}_2\text{CaNb}_4\text{TiO}_{15}$) 12537-42-7P, Barium niobium
 strontium titanium oxide ($\text{Ba}_2\text{Nb}_4\text{SrTiO}_{15}$) 37185-09-4P, Barium
 niobium strontium oxide ($\text{BaNb}_4\text{SrO}_{12}$) 60688-42-8P, Barium niobium
 oxide ($\text{Ba}_3\text{Nb}_{10}\text{O}_{28}$) 98724-70-0P, Niobium strontium titanium oxide
 ($\text{Nb}_4\text{Sr}_3\text{TiO}_{15}$) 128089-18-9P, Barium niobium sodium strontium oxide
 ($\text{Ba}_{0.4}\text{Nb}_2\text{Na}_{0.4}\text{Sr}_{0.4}\text{O}_6$) 143499-29-0P, Barium niobium strontium
 titanium oxide ($\text{BaNb}_4\text{Sr}_2\text{TiO}_{15}$) 225934-68-9P, Barium niobium
 strontium titanium oxide ($\text{Ba}_{0.4}\text{Nb}_{0.7}\text{Sr}_{0.2}\text{Ti}_{0.3}\text{O}_{2.95}$) 225934-69-0P,
 Niobium sodium strontium oxide ($\text{NbNa}_{0.2}\text{Sr}_{0.4}\text{O}_3$) 225934-70-3P,
 Barium niobium sodium oxide ($\text{Ba}_{0.4}\text{NbNa}_{0.2}\text{O}_3$) 225934-72-5P, Barium
 niobium strontium oxide ($\text{Ba}_{0.25}\text{NbSr}_{0.2}\text{O}_{2.95}$) 225934-74-7P, Barium
 calcium niobium oxide ($\text{Ba}_{0.35}\text{Ca}_{0.15}\text{NbO}_3$)

(synthesis and elec. characterization of niobium based tetragonal
 tungsten bronzes as potential anodes for solid oxide fuel
 cells)

L27 ANSWER 9 OF 22 HCA COPYRIGHT 2000 ACS

AN 130:284514 HCA

TI **Interconnector** materials of substituted calcium titanium
 trioxides and their use in **solid electrolyte**
fuel cells

IN Miyaji, Masakazu; Yamamoto, Hirokazu; Tsuru, Yasuhiko; Nishi, Toshio

PA Mitsubishi Heavy Industries, Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11086887	A2	19990330	JP 1997-245077	19970910
AB	The materials are shown as $\text{Ca}_{1-x}\text{AXTiO}_3$ (A = La, Sm, Pr, Gd, Nd, Y, Er) and used as matrixes in interconnectors for the fuel cells . The interconnectors using the materials have improved elec. cond., durability, and heat cycle resistance.				

IT **199799-76-3**, Calcium praseodymium titanium oxide
 ($(\text{Ca},\text{Pr})\text{TiO}_3$) **199799-78-5**, Calcium neodymium titanium
 oxide ($(\text{Ca},\text{Nd})\text{TiO}_3$) **222631-66-5**, Calcium gadolinium
 titanium oxide ($(\text{Ca},\text{Gd})\text{TiO}_3$)
 ($\text{Ca}_{1-x}\text{AxTiO}_3$ **interconnectors** with high elec. cond.,
 durability, and heat cycle resistance for **solid**
electrolyte fuel cells)

RN 199799-76-3 HCA

CN Calcium praseodymium titanium oxide ($(\text{Ca},\text{Pr})\text{TiO}_3$) (9CI) (CA INDEX
 NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ca	0 - 1	7440-70-2

Ti	1	7440-32-6
Pr	0 - 1	7440-10-0

RN 199799-78-5 HCA
 CN Calcium neodymium titanium oxide ((Ca,Nd)TiO₃) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ca	0 - 1	7440-70-2
Ti	1	7440-32-6
Nd	0 - 1	7440-00-8

RN 222631-66-5 HCA
 CN Calcium gadolinium titanium oxide ((Ca,Gd)TiO₃) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ca	0 - 1	7440-70-2
Gd	0 - 1	7440-54-2
Ti	1	7440-32-6

IT **144021-35-2P**, Calcium lanthanum titanium oxide (Ca_{0.9}La_{0.1}TiO₃) **222631-59-6P**, Calcium samarium titanium oxide (Ca_{0.9}Sm_{0.1}TiO₃) **222631-61-0P**, Calcium erbium titanium oxide (Ca_{0.9}Er_{0.1}TiO₃)
 (Ca_{1-x}A_xTiO₃ **interconnectors** with high elec. cond., durability, and heat cycle resistance for **solid electrolyte fuel cells**)

RN 144021-35-2 HCA
 CN Calcium lanthanum titanium oxide (Ca_{0.9}La_{0.1}TiO₃) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ca	0.9	7440-70-2
Ti	1	7440-32-6
La	0.1	7439-91-0

RN 222631-59-6 HCA
 CN Calcium samarium titanium oxide (Ca_{0.9}Sm_{0.1}TiO₃) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
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Component	Ratio	Component Registry Number
O	3	17778-80-2
Ca	0.9	7440-70-2
Ti	1	7440-32-6
Sm	0.1	7440-19-9

RN 222631-61-0 HCA

CN Calcium erbium titanium oxide (Ca_{0.9}Er_{0.1}TiO₃) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ca	0.9	7440-70-2
Er	0.1	7440-52-0
Ti	1	7440-32-6

IC ICM H01M008-02

ICS C04B035-46; H01M008-12

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST **fuel cell interconnector** calcium titanium trioxide; **solid electrolyte fuel cell interconnector** oxide; lanthanum calcium titanium oxide **interconnector**; samarium calcium titanium oxide **interconnector**; praseodymium calcium titanium oxide **interconnector**; gadolinium calcium titanium oxide **interconnector**; neodymium calcium titanium oxide **interconnector**; yttrium calcium titanium oxide **interconnector**; erbium calcium titanium oxide **interconnector**

IT **Interconnections** (electric)Solid state **fuel cells**

(Ca_{1-x}A_xTiO₃ **interconnectors** with high elec. cond., durability, and heat cycle resistance for **solid electrolyte fuel cells**)

IT **199799-76-3**, Calcium praseodymium titanium oxide ((Ca,Pr)TiO₃) **199799-78-5**, Calcium neodymium titanium oxide ((Ca,Nd)TiO₃) **222631-66-5**, Calcium gadolinium titanium oxide ((Ca,Gd)TiO₃)

(Ca_{1-x}A_xTiO₃ **interconnectors** with high elec. cond., durability, and heat cycle resistance for **solid electrolyte fuel cells**)

IT **144021-35-2P**, Calcium lanthanum titanium oxide (Ca_{0.9}La_{0.1}TiO₃) **150291-44-4P**, Calcium titanium yttrium oxide (Ca_{0.9}TiY_{0.1}O₃) **222631-59-6P**, Calcium samarium titanium oxide (Ca_{0.9}Sm_{0.1}TiO₃) **222631-61-0P**, Calcium erbium titanium oxide (Ca_{0.9}Er_{0.1}TiO₃)

(Ca_{1-x}A_xTiO₃ **interconnectors** with high elec. cond., durability, and heat cycle resistance for **solid electrolyte fuel cells**)

broad-interconnector?

L27 ANSWER 10 OF 22 HCA COPYRIGHT 2000 ACS
 AN 129:21816 HCA
 TI Mixed ionic-electronic conduction in Mn doped gadolinium titanate pyrochlore
 AU Long, N. J.; Porat, O.; Tuller, H. L.
 CS Crystal Physics and Electroceramics Laboratory, Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, 02139, USA
 SO Proc. - Electrochem. Soc. (1998), 97-24(Ionic and Mixed Conducting Ceramics), 350-362
 CODEN: PESODO; ISSN: 0161-6374
 PB Electrochemical Society
 DT Journal
 LA English
 AB The a.c. impedance response of the electron blocking **electrochem. cell** (Gd_{0.92}Ca_{0.08})₂Ti₂O₇ / Gd₂(Ti_{0.9}Mn_{0.1})O₇ / (Gd_{0.92}Ca_{0.08})₂Ti₂O₇ was measured over the frequency range 106 Hz .gtoreq. f .gtoreq. 10⁻⁴ Hz. The ionic cond. of the mixed conductor, Gd₂(Ti_{0.9}Mn_{0.1})O₇, was extd. from the combination of the low frequency Warburg impedance, and the total cond. derived from the high frequency spectrum. The activation energy of the ionic cond., 1.5 eV, was deconvoluted into oxygen vacancy formation (0.7 eV) and migration (0.8 eV) components with the assistance of a defect model. The high ionic transference nos. at elevated PO₂ were confirmed by oxygen concn. cell measurements. The mixed ionic electronic conductors are important to operation of electrochem. devices such as solid oxide **fuel cells** and membranes for oxygen sepn.
 IT **207739-63-7**, Calcium gadolinium titanium oxide (Ca_{0.16}Gd_{1.84}Ti₂O₇) (pyrochlore; mixed ionic-electronic conduction in Mn doped gadolinium titanate ceramic membranes for electrochem. devices)
 RN 207739-63-7 HCA
 CN Calcium gadolinium titanium oxide (Ca_{0.16}Gd_{1.84}Ti₂O₇) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	7	17778-80-2
Ca	0.16	7440-70-2
Gd	1.84	7440-54-2
Ti	2	7440-32-6

CC 76-2 (Electric Phenomena)
 Section cross-reference(s): 72
 IT **207739-63-7**, Calcium gadolinium titanium oxide (Ca_{0.16}Gd_{1.84}Ti₂O₇) 207739-64-8, Gadolinium manganese titanium oxide (Gd₂Mn_{0.1}Ti_{0.9}O₇) (pyrochlore; mixed ionic-electronic conduction in Mn doped gadolinium titanate ceramic membranes for electrochem. devices)

L27 ANSWER 11 OF 22 HCA COPYRIGHT 2000 ACS *NO*
 AN 128:186994 HCA
 TI Electroconductivity and nature of ionic transport in the calcium titanate-based substituted perovskites in humid atmosphere
 AU Gorelov, V. P.; Balakireva, V. B.
 CS Ural Div., Russian Acad. Sci., Inst. High-Temp. Electrochemistry, Yekaterinburg, 620219, Russia
 SO Russ. J. Electrochem. (1997), 33(12), 1346-1350
 CODEN: RJELE3; ISSN: 1023-1935
 PB MAIK Nauka/Interperiodica Publishing
 DT Journal
 LA English
 AB Electrocond. of ceramic samples of $\text{CaTi}_{1-x}\text{Fe}_x\text{O}_{3-\alpha}$. ($x=0.0-0.20$) and $\text{CaTi}_{0.95}\text{M}_{0.05}\text{O}_{3-\alpha}$. ($\text{M}=\text{In}, \text{Ga}, \text{Cr}$) is measured in air (650-1050.degree.C) and as a function of $p\text{O}_2$ and humidity. In air, at equal concns. of additives, the electrocond. grows in the series $\text{In} < \text{Ga} < \text{Cr} < \text{Fe}$ and with the increasing iron concn.; it does not depend on humidity. Transfer nos. t_i for ions and protons are detd. in the system $\text{CaTi}_x\text{Fe}_{1-x}\text{O}_3$. During oxidn. or redn., the values of t_i increase or decrease, resp., with the temp. The protonic cond. does not exceed 2% of the total value and is time-independent; possible reasons for this are discussed.
 IT **203203-85-4D**, Calcium chromium titanium oxide ($\text{CaCr}_{0.05}\text{Ti}_{0.95}\text{O}_3$), oxygen-deficient (elec. cond.; electrocond. and nature of ionic transport in calcium titanate-based substituted perovskites in humid atm.)
 RN 203203-85-4 HCA
 CN Calcium chromium titanium oxide ($\text{CaCr}_{0.05}\text{Ti}_{0.95}\text{O}_3$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ca	1	7440-70-2
Cr	0.05	7440-47-3
Ti	0.95	7440-32-6

CC 76-2 (Electric Phenomena)
 Section cross-reference(s): 57, 72
 IT 203203-82-1D, Calcium iron titanium oxide ($\text{CaFe}_{0-0.2}\text{Ti}_{0.8-1.0}\text{O}_3$), oxygen-deficient 203203-83-2D, Calcium indium titanium oxide ($\text{CaIn}_{0.05}\text{Ti}_{0.95}\text{O}_3$), oxygen-deficient 203203-84-3, Calcium gallium titanium oxide ($\text{CaGa}_{0.05}\text{Ti}_{0.95}\text{O}_3$) **203203-85-4D**, Calcium chromium titanium oxide ($\text{CaCr}_{0.05}\text{Ti}_{0.95}\text{O}_3$), oxygen-deficient (elec. cond.; electrocond. and nature of ionic transport in calcium titanate-based substituted perovskites in humid atm.)

L27 ANSWER 12 OF 22 HCA COPYRIGHT 2000 ACS *Anode*
 AN 128:24892 HCA
 TI Synthesis and electrical characterization of doped perovskite

titanates as potential anode materials for solid oxide **fuel cells**

AU Slater, Peter R.; Fagg, Duncan P.; Irvine, John T. S.
 CS University of St. Andrews, School of Chemistry, Fife, KY16 9AJ, UK
 SO J. Mater. Chem. (1997), 7(12), 2495-2498
 CODEN: JMACEP; ISSN: 0959-9428
 PB Royal Society of Chemistry
 DT Journal
 LA English
 AB This work reports the synthesis and elec. characterization over a range of oxygen partial pressures (10-20-1 atm) of the A-site deficient perovskites $\text{Sr}_{1-3x/2}\text{La}_x\text{TiO}_{3-\delta}$, with a view to establishing their potential as anode materials for solid oxide **fuel cells**. Single phase samples were obsd. for synthesis in air for 0.1 to 0.6, and the materials remained phase pure for both high and low oxygen partial pressures at the temp. of 930.degree.. Good elec. cond., which increased with increasing La content, was obsd. on redn. in low oxygen partial pressures, with values as high as 7 S/cm [$P(\text{O}_2) = 10-20$ atm], similar to values obsd. for the related system, $\text{Sr}_{1-x/2}\text{Ti}_{1-x}\text{Nb}_x\text{O}_{3-\delta}$, examd. previously. The cond. of the fully reduced samples showed metallic character at 100-930.degree.. As the oxygen partial pressure was raised, the cond. dropped, showing an approx. $[P(\text{O}_2)]^{-1/6}$ dependence for porous samples. New samples, $\text{Sr}_{1-y/2-3x/2}\text{La}_x\text{Ti}_{1-y}\text{Nb}_y\text{O}_{3-\delta}$, with both La and Nb substitutions, were also studied, and these phases showed similar elec. behavior. Further results for the $\text{Sr}_{1-x/2}\text{Ti}_{1-x}\text{Nb}_x\text{O}_{3-\delta}$ system are presented and compared with the La doped systems.

IT **74969-29-2DP**, Lanthanum strontium titanium oxide ($\text{La}_2\text{SrTi}_4\text{O}_{12}$), oxygen-deficient **199444-29-6DP**, Lanthanum strontium titanium oxide ($\text{La}_{0.2}\text{Sr}_{0.7}\text{TiO}_3$), oxygen-deficient **199444-30-9DP**, Lanthanum strontium titanium oxide ($\text{La}_{0.4}\text{Sr}_{0.4}\text{TiO}_3$), oxygen-deficient **199444-31-0DP**, Lanthanum strontium titanium oxide ($\text{La}_{0.6}\text{Sr}_{0.1}\text{TiO}_3$), oxygen-deficient **199444-32-1DP**, oxygen-deficient **199444-33-2DP**, oxygen-deficient (synthesis and elec. characterization of doped perovskite titanates as potential anode materials for solid oxide **fuel cells**)

RN 74969-29-2 HCA
 CN Lanthanum strontium titanium oxide ($\text{La}_2\text{SrTi}_4\text{O}_{12}$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	12	17778-80-2
Ti	4	7440-32-6
Sr	1	7440-24-6
La	2	7439-91-0

RN 199444-29-6 HCA

CN Lanthanum strontium titanium oxide (La0.2Sr0.7TiO3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ti	1	7440-32-6
Sr	0.7	7440-24-6
La	0.2	7439-91-0

RN 199444-30-9 HCA

CN Lanthanum strontium titanium oxide (La0.4Sr0.4TiO3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ti	1	7440-32-6
Sr	0.4	7440-24-6
La	0.4	7439-91-0

RN 199444-31-0 HCA

CN Lanthanum strontium titanium oxide (La0.6Sr0.1TiO3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ti	1	7440-32-6
Sr	0.1	7440-24-6
La	0.6	7439-91-0

RN 199444-32-1 HCA

CN Lanthanum niobium strontium titanium oxide (La0.2Nb0.2Sr0.6Ti0.8O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ti	0.8	7440-32-6
Sr	0.6	7440-24-6
Nb	0.2	7440-03-1
La	0.2	7439-91-0

RN 199444-33-2 HCA

CN Lanthanum niobium strontium titanium oxide (La0.2Nb0.25Sr0.58Ti0.75O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ti	0.75	7440-32-6
Sr	0.58	7440-24-6
Nb	0.25	7440-03-1
La	0.2	7439-91-0

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 76

ST solid oxide **fuel cell** anode; perovskite titanate doped anode **fuel cell**

IT Electric conductivity

Electric resistance

Fuel cell anodes

(synthesis and elec. characterization of doped perovskite titanates as potential anode materials for solid oxide **fuel cells**)

IT 12060-59-2P, Strontium titanate (SrTiO_3) **74969-29-2DP**, Lanthanum strontium titanium oxide ($\text{La}_2\text{SrTi}_4\text{O}_{12}$), oxygen-deficient **199444-29-6DP**, Lanthanum strontium titanium oxide ($\text{La}_{0.2}\text{Sr}_{0.7}\text{TiO}_3$), oxygen-deficient **199444-30-9DP**, Lanthanum strontium titanium oxide ($\text{La}_{0.4}\text{Sr}_{0.4}\text{TiO}_3$), oxygen-deficient **199444-31-0DP**, Lanthanum strontium titanium oxide ($\text{La}_{0.6}\text{Sr}_{0.1}\text{TiO}_3$), oxygen-deficient **199444-32-1DP**, oxygen-deficient **199444-33-2DP**, oxygen-deficient 199444-34-3DP, Niobium strontium titanium oxide ($\text{Nb}_{0.15}\text{Sr}_{0.92}\text{Ti}_{0.85}\text{O}_3$), oxygen-deficient 199444-35-4DP, Niobium strontium titanium oxide ($\text{Nb}_{0.25}\text{Sr}_{0.88}\text{Ti}_{0.75}\text{O}_3$), oxygen-deficient 199444-36-5DP, Niobium strontium titanium oxide ($\text{Nb}_{0.4}\text{Sr}_{0.8}\text{Ti}_{0.6}\text{O}_3$), oxygen-deficient

(synthesis and elec. characterization of doped perovskite titanates as potential anode materials for solid oxide

fuel cells)

L27 ANSWER 13 OF 22 HCA COPYRIGHT 2000 ACS

AN 126:244073 HCA

TI Electroless plating for electrode on ceramic parts

IN Kawamura, Toshuki

PA Sony Corp, Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
PI	JP 09053183	A2	19970225	JP 1995-231970	19950817
AB	A ceramic substrate is etched to rough the surface, subjected to .gtoreq.1 repeating process comprising catalyzing (addn. of				

Ele made on substrate

catalysts), activating the catalyst, and washing by an acid then subjected to catalyzing, activating the catalyst, and electroless plating. The process provides coated films with improved adhesion without affecting Q, i.e., 1/(conductor loss).

IT 107067-57-2, Barium neodymium titanium oxide
(electroless plating for formation of electrode on ceramic substrate including repeating catalyzing and activating catalyst)
RN 107067-57-2 HCA
CN Barium neodymium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Ba	x	7440-39-3
Ti	x	7440-32-6
Nd	x	7440-00-8

IC ICM C23C018-18
ICS C04B041-88
CC 72-2 (Electrochemistry)
IT 107067-57-2, Barium neodymium titanium oxide
(electroless plating for formation of electrode on ceramic substrate including repeating catalyzing and activating catalyst)

L27 ANSWER 14 OF 22 HCA COPYRIGHT 2000 ACS

AN 125:147112 HCA

TI Oxide semiconductor solar cells

IN Namigashira, Tsunehiro

PA Fujitsu Ltd, Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
PI	JP 08148706	A2	19960607	JP 1994-281682	19941116
AB	The solar cells have successively a 1st oxide semiconductor layer, an oxide intermediate layer, and a 2nd oxide semiconductor layer forming a Schottky barrier with the intermediate layer. The 1st semiconductor layer may be doped and has a 1st cond. type, the intermediate layer may be an undoped i layer composed of the same material as the 1st semiconductor layer, and the 2nd semiconductor layer may be an electrode. Another structure of the solar cells have successively a doped 1st oxide semiconductor layer, a 3rd oxide semiconductor layer having a carrier amt. different from the 1st semiconductor layer, and a 2nd oxide semiconductor electrode layer.				
IT	55072-50-9, Lanthanum strontium titanium oxide (structure of oxide semiconductor solar cells)				
RN	55072-50-9 HCA				
CN	Lanthanum strontium titanium oxide (9CI) (CA INDEX NAME)				

NO

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Ti	x	7440-32-6
Sr	x	7440-24-6
La	x	7439-91-0

IC ICM H01L031-04
 CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
 IT 1312-43-2, Indium oxide (In₂O₃) 12017-94-6, Chromium lanthanum oxide (CrLaO₃) 12060-59-2, Strontium titanium oxide (SrTiO₃) 50926-11-9, Ito **55072-50-9**, Lanthanum strontium titanium oxide
 (structure of oxide semiconductor solar cells)

L27 ANSWER 15 OF 22 HCA COPYRIGHT 2000 ACS *Ni elanale*
 AN 124:158643 HCA
 TI Sol-gel barium titanate thin films on nickel alloy electrodes
 AU Ogawa, T.; Saitoh, S.; Sugiyama, O.; Kondoh, A.; Mochizuka, T.; Masuda, H.
 CS Shizuoka Institute Science and Technology, Fukuroi, Japan
 SO ISAF '94, Proc. IEEE Int. Symp. Appl. Ferroelectr., 9th (1994), 399-403. Editor(s): Pandey, R. K.; Liu, Michael; Safari, Ahmad. Publisher: Institute of Electrical and Electronics Engineers, New York, N. Y.
 CODEN: 62GYAM
 DT Conference
 LA English
 AB A Ni alloy was applied to bottom electrodes of BaTiO₃ thin films and 2-6 mol % La-modified BaTiO₃ thin films prepd. by sol-gel processing. The gel films on a substrate of soda-lime glass with Ni alloy bottom electrodes were crystd. at 600.degree.C. The grains with the size of 1-2 .mu.m consisted of subgrains (20 nm), and the grain size was decreased with increasing La substitution. The remanent polarization of the films decreased with an increase of La substitution and with a decrease of the grain size.

IT **173395-08-9P**, Barium lanthanum titanium oxide
 (Ba_{0.98}La_{0.02}TiO₃) **173395-09-0P**, Barium lanthanum titanate
 (Ba_{0.96}La_{0.04}TiO₃) **173395-10-3P**, Barium lanthanum titanate
 (Ba_{0.94}La_{0.06}TiO₃)
 (sol-gel barium titanate thin films on nickel alloy electrodes)

RN 173395-08-9 HCA
 CN Barium lanthanum titanium oxide (Ba_{0.98}La_{0.02}TiO₃) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2

Crepeau 09/118,833

Ba	0.98	7440-39-3
Ti	1	7440-32-6
La	0.02	7439-91-0

RN 173395-09-0 HCA
CN Barium lanthanum titanium oxide (Ba0.96La0.04TiO3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ba	0.96	7440-39-3
Ti	1	7440-32-6
La	0.04	7439-91-0

RN 173395-10-3 HCA
CN Barium lanthanum titanium oxide (Ba0.94La0.06TiO3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ba	0.94	7440-39-3
Ti	1	7440-32-6
La	0.06	7439-91-0

CC 72-2 (Electrochemistry)
Section cross-reference(s): 66, 76
IT 12047-27-7P, Barium titanate (BaTiO3), uses 173395-08-9P,
Barium lanthanum titanium oxide (Ba0.98La0.02TiO3)
173395-09-0P, Barium lanthanum titanate (Ba0.96La0.04TiO3)
173395-10-3P, Barium lanthanum titanate (Ba0.94La0.06TiO3)
(sol-gel barium titanate thin films on nickel alloy electrodes)

L27 ANSWER 16 OF 22 HCA COPYRIGHT 2000 ACS
AN 122:218561 HCA
TI **Solid electrolyte-electrode system for electrochemical cell**
IN Tuller, Harry L.; Kramer, Steve A.; Spears, Marlene A.; Pal, Uday B.
PA Massachusetts Institute of Technology, USA
SO PCT Int. Appl., 54 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

US patent

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9420997	A1	19940915	WO 1994-US2187	19940222
W: AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, KZ, LK, LU, LV, MG, MN, MW, NL, NO, NZ, PL,				

PT, RO, RU, SD, SE, SK, UA, UZ, VN
 RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT,
 SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG

US 5403461	A	19950404	US 1993-29159	19930310
AU 9463953	A1	19940926	AU 1994-63953	19940222
DE 4491386	T	19960307	DE 1994-4491386	19940222
JP 08507642	T2	19960813	JP 1994-520100	19940222
US 5509189	A	19960423	US 1994-356888	19941215

PRAI US 1993-29159 19930310
 WO 1994-US2187 19940222

AB An electrochem. device, such as a graded solid-oxide **fuel cell**, is provided that includes a **solid electrolyte** and a **solid** electrode of materials having different chem. compns. and elec. properties but having the same cryst. phase. A method for fabricating this device is also provided.

IT **159076-60-5**, Calcium gadolinium titanium oxide (CaO-0.3Gd1.7-2Ti2O6.92-7) **159076-61-6**, Calcium gadolinium titanium oxide (CaO-0.5Gd1-2Ti2O6.88-7) **159076-62-7**, Calcium gadolinium titanium oxide (CaO.04-0.2Gd1.8-1.96Ti2O6.95-6.99)
 (for **fuel-cell electrolyte**
 -electrode system)

RN 159076-60-5 HCA
 CN Calcium gadolinium titanium oxide (CaO-0.3Gd1.7-2Ti2O6.92-7) (9CI)
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	6.92 - 7	17778-80-2
Ca	0 - 0.3	7440-70-2
Gd	1.7 - 2	7440-54-2
Ti	2	7440-32-6

RN 159076-61-6 HCA
 CN Calcium gadolinium titanium oxide (CaO-0.5Gd1-2Ti2O6.88-7) (9CI)
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	6.88 - 7	17778-80-2
Ca	0 - 0.5	7440-70-2
Gd	1 - 2	7440-54-2
Ti	2	7440-32-6

RN 159076-62-7 HCA
 CN Calcium gadolinium titanium oxide (CaO.04-0.2Gd1.8-1.96Ti2O6.95-6.99) (9CI) (CA INDEX NAME)

Component	Ratio	Component
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		Registry Number
=====	=====	=====
O	6.95 - 6.99	17778-80-2
Ca	0.04 - 0.2	7440-70-2
Gd	1.8 - 1.96	7440-54-2
Ti	2	7440-32-6

IT **158920-44-6P**, Calcium gadolinium titanium oxide
 (Ca_{0.04}Gd_{1.96}Ti₂O₇) **158920-46-8P**, Calcium samarium
 titanium oxide (Ca_{0.2}Sm_{1.8}Ti₂O₇) **158920-47-9P**, Samarium
 strontium titanium oxide (Sm_{1.8}Sr_{0.2}Ti₂O₇)
 (for **fuel-cell electrolyte**
 -electrode system)

RN 158920-44-6 HCA

CN Calcium gadolinium titanium oxide (Ca_{0.04}Gd_{1.96}Ti₂O₇) (9CI) (CA
 INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	7	17778-80-2
Ca	0.04	7440-70-2
Gd	1.96	7440-54-2
Ti	2	7440-32-6

RN 158920-46-8 HCA

CN Calcium samarium titanium oxide (Ca_{0.2}Sm_{1.8}Ti₂O₇) (9CI) (CA INDEX
 NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	7	17778-80-2
Ca	0.2	7440-70-2
Ti	2	7440-32-6
Sm	1.8	7440-19-9

RN 158920-47-9 HCA

CN Samarium strontium titanium oxide (Sm_{1.8}Sr_{0.2}Ti₂O₇) (9CI) (CA INDEX
 NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	7	17778-80-2
Ti	2	7440-32-6
Sr	0.2	7440-24-6
Sm	1.8	7440-19-9

IC ICM H01M008-10

ICS H01M004-86; H01M004-90; H01M004-96; B05D001-18; B05D005-12;
 C23C016-00; C30B001-00; C30B001-12; C30B007-00; C08J007-00;

B29C039-00; C25D009-00

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57, 76

ST **fuel cell electrolyte** electrode system

IT **Fuel-cell electrolytes**
(doped and undoped titanates for)

IT Electric conductivity and conduction
(of doped and undoped titanates for **fuel-cell electrolyte**-electrode system)

IT Electrodes
(**fuel-cell**, doped and undoped titanates for)

IT **159076-60-5**, Calcium gadolinium titanium oxide (CaO-0.3Gd1.7-2Ti2O6.92-7) **159076-61-6**, Calcium gadolinium titanium oxide (CaO-0.5Gd1-2Ti2O6.88-7) **159076-62-7**, Calcium gadolinium titanium oxide (CaO.04-0.2Gd1.8-1.96Ti2O6.95-6.99) **159076-63-8**, Aluminum gadolinium titanium oxide (AlO-0.1Gd2Ti1.9-2O6.98-7)
(for **fuel-cell electrolyte**-electrode system)

IT 12024-89-4P, Gadolinium titanium oxide (Gd2Ti2O7) **158920-44-6P**, Calcium gadolinium titanium oxide (CaO.04Gd1.96Ti2O7) 158920-45-7P, Calcium titanium yttrium oxide (CaO.04Ti2Y1.96O7) **158920-46-8P**, Calcium samarium titanium oxide (CaO.2Sm1.8Ti2O7) **158920-47-9P**, Samarium strontium titanium oxide (Sm1.8Sr0.2Ti2O7) 158920-48-0P, Magnesium samarium titanium oxide (Mg0.2Sm1.8Ti2O7)
(for **fuel-cell electrolyte**-electrode system)

IT 12024-89-4P, Gadolinium titanium oxide (Gd2Ti2O7)
(**fuel-cell electrolyte**-electrode system doped with aluminum or calcium or ruthenium)

IT 12037-02-4P, Titanium yttrium oxide (Ti2Y2O7) 12065-87-1P, Samarium titanium oxide (SM2Ti2O7)
(**fuel-cell electrolyte**-electrode system doped with calcium)

IT 7429-90-5, Aluminum, uses 7440-18-8, Ruthenium, uses 7440-70-2, Calcium, uses
(**fuel-cell electrolyte**-electrode system of gadolinium titanate doped with)

L27 ANSWER 17 OF 22 HCA COPYRIGHT 2000 ACS

AN 122:175646 HCA

TI Formal charge of titanium in phases of the system La-Sr-Ti-O and its **interconnection** with superconductivity

AU Murashov, V. V.; Kuz'micheva, G. M.; Mitin, A. V.

CS Mosk. Inst. Tonkoi Khim. Tekhnol., Moscow, Russia

SO Zh. Neorg. Khim. (1994), 39(7), 1192-7
CODEN: ZNOKAQ; ISSN: 0044-457X

DT Journal

LA Russian

AB The prepn. and properties were studied of cubic perovskites from the

No

La-Sr-Ti-O system. Several samples contain inclusions which are superconducting with T_c .gtoreq. 50 K. The T_c correlates with the formal charge on the Ti. Analogous results were obtained for other phase systems using Pb, Nb, and Bi.

IT **161361-60-0P**, Lanthanum strontium titanium oxide (LaSr₂Ti₃O₈) **161361-61-1P**, Lanthanum strontium titanium oxide (LaSr₂Ti₃O₇) **161361-62-2P**, Lanthanum strontium titanium oxide (LaSr₂Ti₃O_{6.5}) **161361-63-3P**, Lanthanum strontium titanium oxide (LaSr₂Ti₃O₆) **161361-64-4P**, Lanthanum strontium titanium oxide (LaSr_{1.4}Ti₃O₆) **161361-65-5P**, Lanthanum strontium titanium oxide (LaSrTi₃O₆) **161361-66-6P**, Lanthanum strontium titanium oxide (LaSr_{1.4}Ti₃O₇)
(supercond. in perovskite phases of La Sr titanate and charge on Ti)

RN 161361-60-0 HCA

CN Lanthanum strontium titanium oxide (LaSr₂Ti₃O₈) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	8	17778-80-2
Ti	3	7440-32-6
Sr	2	7440-24-6
La	1	7439-91-0

RN 161361-61-1 HCA

CN Lanthanum strontium titanium oxide (LaSr₂Ti₃O₇) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	7	17778-80-2
Ti	3	7440-32-6
Sr	2	7440-24-6
La	1	7439-91-0

RN 161361-62-2 HCA

CN Lanthanum strontium titanium oxide (LaSr₂Ti₃O_{6.5}) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	6.5	17778-80-2
Ti	3	7440-32-6
Sr	2	7440-24-6
La	1	7439-91-0

RN 161361-63-3 HCA

CN Lanthanum strontium titanium oxide (LaSr₂Ti₃O₆) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	6	17778-80-2
Ti	3	7440-32-6
Sr	2	7440-24-6
La	1	7439-91-0

RN 161361-64-4 HCA

CN Lanthanum strontium titanium oxide (LaSr_{1.4}Ti₃O₆) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	6	17778-80-2
Ti	3	7440-32-6
Sr	1.4	7440-24-6
La	1	7439-91-0

RN 161361-65-5 HCA

CN Lanthanum strontium titanium oxide (LaSrTi₃O₆) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	6	17778-80-2
Ti	3	7440-32-6
Sr	1	7440-24-6
La	1	7439-91-0

RN 161361-66-6 HCA

CN Lanthanum strontium titanium oxide (LaSr_{1.4}Ti₃O₇) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	7	17778-80-2
Ti	3	7440-32-6
Sr	1.4	7440-24-6
La	1	7439-91-0

CC 76-4 (Electric Phenomena)

Section cross-reference(s): 57, 68

IT 12201-04-6DP, Lanthanum titanium oxide (LaTiO₃), lanthanum-deficient and oxygen-deficient **161361-60-0P**, Lanthanum strontium titanium oxide (LaSr₂Ti₃O₈) **161361-61-1P**, Lanthanum

strontium titanium oxide ($\text{LaSr}_2\text{Ti}_3\text{O}_7$) **161361-62-2P**,
 Lanthanum strontium titanium oxide ($\text{LaSr}_2\text{Ti}_3\text{O}_{6.5}$)
161361-63-3P, Lanthanum strontium titanium oxide
 ($\text{LaSr}_2\text{Ti}_3\text{O}_6$) **161361-64-4P**, Lanthanum strontium titanium
 oxide ($\text{LaSr}_{1.4}\text{Ti}_3\text{O}_6$) **161361-65-5P**, Lanthanum strontium
 titanium oxide ($\text{LaSrTi}_3\text{O}_6$) **161361-66-6P**, Lanthanum
 strontium titanium oxide ($\text{LaSr}_{1.4}\text{Ti}_3\text{O}_7$)

(supercond. in perovskite phases of La Sr titanate and charge on
 Ti)

L27 ANSWER 18 OF 22 HCA COPYRIGHT 2000 ACS

AN 114:34217 HCA

TI **Solid electrolyte** and its manufacture

IN Tamura, Shohei; Sasaki, Sadamitsu; Yumoto, Shigenori; Urairi,
 Masakatsu

PA Nitto Denko Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 01264931	A2	19891023	JP 1988-92590	19880414
AB	A solid electrolyte showing a good O-ion cond. at a relatively low temp. comprises $\text{La}_x\text{Ba}_{1-x}\text{Eu}_y\text{TiO}_3$ ($x = 0.1-0.5$; $y = 0.00005-0.0005$). A method for manufg. the electrolyte involves prepg. a mixt. contg. obsd. amts. of La, Ba, Eu, and Ti, drying the mixt., and heating at .gtoreq.600.degree..				
IT	131343-59-4 , Barium lanthanum titanium oxide ($\text{Ba}_{0.9}\text{La}_{0.1}\text{TiO}_3$) 131343-60-7 , Barium lanthanum titanium oxide ($\text{Ba}_{0.8}\text{La}_{0.2}\text{TiO}_3$) 131343-61-8 , Barium lanthanum titanium oxide ($\text{Ba}_{0.6}\text{La}_{0.4}\text{TiO}_3$) 131344-54-2 , Barium lanthanum titanium oxide ($\text{Ba}_{0.5}\text{La}_{0.5}\text{TiO}_3$) 131344-55-3 , Barium lanthanum titanium oxide ($\text{Ba}_{0.67}\text{La}_{0.33}\text{TiO}_3$) (solid electrolytes , oxygen-ion conductive)				
RN	131343-59-4 HCA				
CN	Barium lanthanum titanium oxide ($\text{Ba}_{0.9}\text{La}_{0.1}\text{TiO}_3$) (9CI) (CA INDEX NAME)				

Electrolyte

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ba	0.9	7440-39-3
Ti	1	7440-32-6
La	0.1	7439-91-0

RN 131343-60-7 HCA

CN Barium lanthanum titanium oxide ($\text{Ba}_{0.8}\text{La}_{0.2}\text{TiO}_3$) (9CI) (CA INDEX
 NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ba	0.8	7440-39-3
Ti	1	7440-32-6
La	0.2	7439-91-0

RN 131343-61-8 HCA
 CN Barium lanthanum titanium oxide (Ba0.6La0.4TiO3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ba	0.6	7440-39-3
Ti	1	7440-32-6
La	0.4	7439-91-0

RN 131344-54-2 HCA
 CN Barium lanthanum titanium oxide (Ba0.5La0.5TiO3) (9CI) (CA INDEX NAME)


Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ba	0.5	7440-39-3
Ti	1	7440-32-6
La	0.5	7439-91-0

RN 131344-55-3 HCA
 CN Barium lanthanum titanium oxide (Ba0.67La0.33TiO3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ba	0.67	7440-39-3
Ti	1	7440-32-6
La	0.33	7439-91-0

IC ICM C01G023-00
 ICS B01D053-32; C04B035-46; H01M008-12
 CC 76-2 (Electric Phenomena)
 ST barium titanate **solid electrolyte** conductor;
 europium barium titanate electrolyte conductor; lanthanum barium
 titanate electrolyte conductor
 IT 7440-53-1, Europium, uses and miscellaneous
 (**solid electrolytes** from titanate contg.,

oxygen-conductive)
 IT 131343-59-4, Barium lanthanum titanium oxide
 (Ba_{0.9}La_{0.1}TiO₃) 131343-60-7, Barium lanthanum titanium
 oxide (Ba_{0.8}La_{0.2}TiO₃) 131343-61-8, Barium lanthanum
 titanium oxide (Ba_{0.6}La_{0.4}TiO₃) 131344-54-2, Barium
 lanthanum titanium oxide (Ba_{0.5}La_{0.5}TiO₃) 131344-55-3,
 Barium lanthanum titanium oxide (Ba_{0.67}La_{0.33}TiO₃)
 (solid electrolytes, oxygen-ion conductive)

L27 ANSWER 19 OF 22 HCA COPYRIGHT 2000 ACS 
 AN 112:225546 HCA
 TI Electrochemical synthesis of ceramic films and powders
 IN Coyle, R. Tom; Switzer, Jay A.
 PA Union Oil Co. of California, USA
 SO U.S., 5 pp.
 CODEN: USXXAM
 DT Patent
 LA English
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4882014	A	19891121	US 1988-159759	19880224

AB Ceramic precursor compns., such as metal hydroxides and oxides, are
 electrochem. deposited in a biased **electrochem.**
cell. The cell typically generates OH⁻ that ppt. metal or
 semimetal ions to form insol. solids that may be sepd. from the
 cell, then dried, calcined, and sintered to form a ceramic compn.

IT 72840-51-8P
 (prodn. of, from electrochem. prepd. ceramic precursors)

RN 72840-51-8 HCA
 CN Barium neodymium titanium oxide (BaNd₂Ti₄O₁₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	12	17778-80-2
Ba	1	7440-39-3
Ti	4	7440-32-6
Nd	2	7440-00-8

IC ICM C25B001-00
 NCL 204001500
 CC 72-9 (Electrochemistry)
 Section cross-reference(s): 57

IT 409-21-2P, Silicon carbide, preparation 1304-56-9P, Beryllium
 oxide 1309-48-4P, Magnesium oxide, preparation 1312-81-8P,
 Lanthanum oxide 1313-97-9P, Neodymium oxide 1314-13-2P, Zinc
 oxide, preparation 1314-20-1P, Thorium dioxide, preparation
 1314-23-4P, Zirconium dioxide, preparation 1344-28-1P, Aluminum
 oxide, preparation 1344-57-6P, Uranium dioxide, preparation
 7631-86-9P, Silicon dioxide, preparation 10043-11-5P, Boron
 nitride, preparation 11129-48-9P, Iron zinc oxide 12003-67-7P

12008-21-8P, Lanthanum hexaboride 12047-27-7P, Barium titanate, preparation 12070-08-5P, Titanium carbide (TiC) 12070-12-1P, Tungsten carbide (WC) 12323-03-4P, Barium sodium niobium oxide (Ba₂NaNb₅O₁₅) 12626-81-2P, Lead titanium zirconium oxide (Pb(Ti,Zr)O₃) 13463-67-7P, Titanium dioxide, preparation 18282-10-5P, Tin dioxide 24304-00-5P, Aluminum nitride **72840-51-8P** 107762-68-5P, Europium yttrium oxide sulfide ((Eu,Y)₂O₂S) 109166-45-2P, Barium copper lanthanum oxide ((Ba,La)₂CuO₄) 111418-64-5P, Barium copper lanthanum strontium oxide ((Ba,La,Sr)₂CuO₄) 117261-99-1P, Bismuth calcium copper strontium oxide (BiO-1CaO-1Cu₂SrO₆) 123213-41-2P, Aluminum gadolinium scandium oxide 127242-13-1P, Lanthanum titanium zirconium oxide 127275-79-0P, Barium gadolinium scandium oxide (prodn. of, from electrochem. prepd. ceramic precursors)

L27 ANSWER 20 OF 22 HCA COPYRIGHT 2000 ACS *ND*
 AN 112:23516 HCA
 TI Cathodic polarization phenomena of oxide electrodes with stabilized zirconia electrolyte
 AU Yamamoto, Osamu; Takeda, Yasuo; Kanno, Ryoji; Noda, Muneyoshi
 CS Fac. Eng., Mie Univ., Tsu, 514, Japan
 SO Adv. Ceram. (1988), 24B(Sci. Technol. Zirconia 3), 829-35
 CODEN: ADCED; ISSN: 0730-9546
 DT Journal
 LA English
 AB Electrodes of perovskite oxide La_{1-x}Sr_xCoO_{3-z} sputtered on Y₂O₃-stabilized ZrO₂ (YSZ) (for high-temp. **fuel cells**) showed high O redn. activity at 800.degree. in air; however, the activity declined with annealing at .gtoreq.1000.degree.. This decline of the electrode performance was caused by the chem. reaction of YSZ and perovskite oxides. The reaction was depressed by inserting a film of perovskite-type oxide ion conductors such as La_{0.9}Ba_{0.1}AlO_{2.95} and Nd_{0.9}Sr_{0.1}AlO_{2.95} between the YSZ and the perovskite electrode.
 IT **124450-30-2**, Aluminum calcium titanium oxide (Al_{0.3}CaTi_{0.7}O_{2.85}) (elec. cond. of, for **fuel cells**)
 RN 124450-30-2 HCA
 CN Aluminum calcium titanium oxide (Al_{0.3}CaTi_{0.7}O_{2.85}) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2.85	17778-80-2
Ca	1	7440-70-2
Ti	0.7	7440-32-6
Al	0.3	7429-90-5

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): **72**

- ST perovskite oxide cathode **fuel cell**; lanthanum strontium cobalt oxide cathode; yttria stabilized zirconia cathode perovskite; oxygen redn perovskite cathode; barium aluminum lanthanum oxide cathode; neodymium strontium aluminum oxide cathode
- IT Electric conductivity and conduction
(of perovskite oxides, for high-temp. **fuel-cells**)
- IT Electrolytic polarization
(cathodic, of perovskite oxide electrodes in stabilized zirconia **electrolyte**, for **fuel cells**)
- IT Cathodes
(**fuel-cell**, perovskite oxide, on yttria-stabilized zirconia, perovskite oxide ion conductor layers for)
- IT 12016-86-3D, Cobalt lanthanum oxide (CoLaO₃), oxygen-deficient
12310-74-6D, Cobalt lanthanum strontium oxide (CoLa_{0.5}Sr_{0.5}O₃), oxygen-deficient
106390-66-3D, Lanthanum manganese strontium oxide (La_{0.7}MnSr_{0.3}O₃), oxygen-deficient
107121-69-7D, Cobalt lanthanum strontium oxide (CoLa_{0.7}Sr_{0.3}O₃), oxygen-deficient
107121-70-0D, Chromium lanthanum strontium oxide (CrLa_{0.7}Sr_{0.3}O₃), oxygen-deficient
107121-72-2D, Iron lanthanum strontium oxide (FeLa_{0.7}Sr_{0.3}O₃), oxygen-deficient
110758-50-4D, Cobalt lanthanum strontium oxide (CoLa_{0.9}Sr_{0.1}O₃), oxygen-deficient
112956-99-7D, Cobalt lanthanum strontium oxide (CoLa_{0.1}Sr_{0.9}O₃), oxygen-deficient
(cathodic polarization of, for high-temp. **fuel cells**)
- IT 115709-88-1, Indium lanthanum strontium oxide (InLa_{0.9}Sr_{0.1}O_{2.95})
116285-21-3, Aluminum barium lanthanum oxide (AlBa_{0.1}La_{0.9}O_{2.95})
124450-30-2, Aluminum calcium titanium oxide (Al_{0.3}CaTi_{0.7}O_{2.85})
124450-31-3, Aluminum neodymium strontium oxide (AlNd_{0.9}Sr_{0.1}O_{2.95})
(elec. cond. of, for **fuel cells**)
- IT 1314-23-4, Zirconia, uses and miscellaneous
(electrolytes of yttria-stabilized, reactivity of perovskite oxides with, for **fuel cells**)
- IT 1314-36-9, Yttria, uses and miscellaneous
(electrolytes of zirconia stabilized with, reactivity of perovskite oxides with, for **fuel cells**)

L27 ANSWER 21 OF 22 HCA COPYRIGHT 2000 ACS

AN 109:9384 HCA

TI Hydrogen-absorbing anodes of sealed alkaline **batteries**

IN Yanagihara, Nobuyuki; Kawano, Hiroshi; Ikoma, Munehisa; Matsumoto, Isao

PA Matsushita Electric Industrial Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

PATENT NO.

KIND

DATE

APPLICATION NO.

DATE

PI JP 62295352 A2 19871222 JP 1986-138581 19860613
 JP 08015076 B4 19960214

AB The anodes are coated with a O-absorbing layer of perovskite-type rare earth metal oxide MM1O3 (M = rare earth metal contg. optionally Sr, M1 Co, Mn, Ni, Fe, Cr, Cu, and/or Ti) and a binder. Thus, 15 g H-absorbing alloy Mm0.5La0.5Ni3.5Co1.5 (Mm = misch metal) was powd., pasted with poly(vinyl alc.), coated on a punched metal sheet, pressed, and dried. A paste of 2 g perovskite-type La0.8Sr0.2CoO3 was coated on the dried alloy layer to form an anode. A **battery** having a Ni cathode and this anode showed 2 kg/cm² internal pressure when charged to 150% capacity at 0.2C (C = nominal capacity), vs. >10 kg/cm² for a **battery** having an uncoated anode. The decrease of capacity was 2.4% at the 200th cycle for the invention, and 50% at 120th cycle for the latter **battery**.

IT **114966-27-7**, Lanthanum strontium titanium oxide (La0.8Sr0.2TiO3)
 (anodes coated with perovskite-type, hydrogen-absorbing, for **batteries**)

RN 114966-27-7 HCA

CN Lanthanum strontium titanium oxide (La0.8Sr0.2TiO3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	3	17778-80-2
Ti	1	7440-32-6
Sr	0.2	7440-24-6
La	0.8	7439-91-0

IC ICM H01M004-24
 ICS H01M004-62; H01M010-34; H01M010-52

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** anode hydrogen coating; rare earth oxide hydrogen anode

IT Rare earth oxides
 (perovskite-type, anodes coated with, hydrogen-absorbing, for **batteries**)

IT Anodes
 (**battery**, hydrogen-absorbing alloy, perovskite-type rare earth oxide coated)

IT 12016-86-3, Cobalt lanthanum oxide (CoLaO3) 12017-94-6, Chromium lanthanum oxide (CrLaO3) 12022-43-4, Iron lanthanum oxide (FeLaO3) 12031-12-8, Lanthanum manganese oxide (LaMnO3) 12031-18-4, Lanthanum nickel oxide (LaNiO3) 12201-04-6, Lanthanum titanium oxide (LaTiO3) 37249-72-2, Copper lanthanum oxide (CuLaO3) 108916-09-2, Cobalt lanthanum strontium oxide (CoLa0.8Sr0.2O3) 108916-22-9, Lanthanum manganese strontium oxide (La0.8MnSr0.2O3) 109546-91-0, Iron lanthanum strontium oxide (FeLa0.8Sr0.2O3) 110584-01-5, Copper lanthanum strontium oxide (CuLa0.8Sr0.2O4) 110584-70-8, Chromium lanthanum strontium oxide (CrLa0.8Sr0.2O3)

113671-77-5, Lanthanum nickel strontium oxide ($\text{La}_{0.8}\text{NiSr}_{0.2}\text{O}_3$)
114966-27-7, Lanthanum strontium titanium oxide
 ($\text{La}_{0.8}\text{Sr}_{0.2}\text{TiO}_3$)
 (anodes coated with perovskite-type, hydrogen-absorbing, for
batteries)

IT 114295-28-2
 (hydrogen-absorbing, anodes, perovskite-type rare earth oxide
 coated, for **batteries**)

L27 ANSWER 22 OF 22 HCA COPYRIGHT 2000 ACS

AN 77:134196 HCA

TI Perovskite-type oxide **solid-electrolyte**
 high-temperature **fuel cells**

AU Takahashi, Takehiko; Iwahara, Hiroyasu

CS Fac. Eng., Nagoya Univ., Nagoya, Japan

SO Toyoda Kenkyu Hokoku (1972), (25), 39-47

CODEN: TOKHA6

DT Journal

LA Japanese

AB Perovskite-type oxide solid solns. were used as electrolytes for
 high-temp. **fuel cells**. H-O **fuel**

cells with these oxides were constructed using Pt as the
 electrode material, and the cell performances were studied at
 800-1000.degree.. To improve the cell performance, an attempt was
 made to apply the solid soln. of $(\text{CeO}_2)_{0.6}(\text{LaO}_{1.5})_{0.4}$ to the anode
 materials, and as a consequence, the anode polarization was markedly
 reduced. Of the cells studied, the $\text{CaTi}_{0.7}\text{Al}_{0.3}\text{O}_{3-\alpha}$.

electrolyte cell showed the most excellent and
 stable characteristics. The power output of this cell was 75 mW/cm²
 with a terminal voltage of 0.75 V. Several kinds of fuels rather
 than H could be used in this cell with almost the same performance
 as with H.

IT **37322-94-4**

(**fuel-cell electrolyte**)

RN 37322-94-4 HCA

CN Aluminum calcium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Ca	x	7440-70-2
Ti	x	7440-32-6
Al	x	7429-90-5

CC 77-2 (Electrochemistry)

ST perovskite type oxide **solid electrolyte**;
fuel cell solid electrolyt

IT Oxides, uses and miscellaneous

(**fuel-cell electrolytes**,

Pervoskite-type)

IT **Fu 1 cells**

Electrolyte

(high-temp., with Perovskite-type oxide **solid electrolytes**)

- IT Lanthanum oxide (La_2O_3), solid soln. with cerium dioxide
Cerium oxide (CeO_2), solid soln. with lanthanum sesquioxide
(**fuel-cell electrolyte**)
- IT **37322-94-4**
(**fuel-cell electrolyte**)